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Bulletin

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FOREWORD

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SELECTED TRANSLATIONS ON EUROPEAN RAILROAD COOPERATION
FROM THE OSSHD (ORGANIZATION FOR RR COOPERATION)
BULLETIN

Following is a translation of selected articles from the German-language periodical Zeitschrift der Organisation für die Zusammenarbeit der Eisenbahnen (Bulletin of the Organization for RR Cooperation), Warsaw, Vol. III, No. 3, 1960. Page, and author, if any, are given under individual article headings.

<u>Table of Contents</u>	<u>Page</u>
I. Standardization of and Specialization in the Production of Traction Rolling Stock	1
II. Effective Measures to Reduce the Tare of Railroad Cars	7
III. Small-Scale Mechanization of Maintenance of Way	17
IV. Some Experiences Concerning Centralized Long-Distance Highway Freight Transportation Using the Prime Mover Exchange System	25
V. Establishment of a Technical and Economic Information System - An Urgent OSSHD Task	32
VI. Report on the Work of the OSSHD Committee and Commissions	38 40
A. Committee Session No. 30	38
B. Committee Session No. 31	38
C. The Firm Text of the SMPS Is In Force	39
D. Conference of the Third Commission	40
E. Joint Conference of the OSSHD and UIC Experts	40
F. Regional Conference for the Coordination of 1960 Transport Plans	41
G. Conference of the Fourth Commission	42
H. Second Conference of the Commission for Motor Transport and Highways	48

I. STANDARDIZATION OF AND SPECIALIZATION IN THE PRODUCTION
OF TRACTION ROLLING STOCK

Pages 1 - 3

Eng. S. S. Kalinin,
Chairman of the Eighth
Commission

In order to meet the constantly growing transport requirements placed on the railroads of the socialist countries, a reconstruction of the means of traction to be brought about by an extensive introduction of electric and diesel traction.

However, to a large extent, the introduction of new traction types is hampered by the fact that the locomotive building industries of several countries neither can guarantee the production of the required numbers of electric and diesel locomotives and motor trains, nor can their products meet completely modern requirements for economy or performance. In many cases the introduction of new traction types will be inhibited by the cost of the new stock.

The production of new traction rolling stock can be accelerated considerably by a standardization of types, assemblies and components, and by specialization in production. This is especially true in diesel locomotives, the planning and production of which are going on concurrently in many plants in the Socialist camp. A considerable number of nearly identical diesel locomotives are in production or developmental stages. In just the countries participating in the RGW (Rat fur Gegenseitige Wirtschaftshilfe-Council for Mutual Economic Aid), for instance, there are being built nine diesel locomotive types with a rating of 135 to 180 hp, six with a rating of 300 to 450 hp, five with a rating of 600 to 800 hp, and many others with parameters which are similar.

Up to now it has been the tendency in each country to build all the types of diesel locomotives needed by its own transport sector. The production of traction stock according to an expanded nomenclature complicates mass production, which is based on the wide use of automation and complex mechanization of the production processes. It also increases production costs and does not create conditions whereby construction can be improved in accordance with

current requirements. The failure to specialize in production and to exchange technical documentation on the development of traction stock has led to the employment of an immense number of designers engaged in the development of locomotives which are similar in their parameters and which are already available in other countries.

As a result, time and means are often lacking for the careful development of the individual assemblies of the locomotives, and they come into being inefficient, expensive, heavy, and in many cases, already morally obsolete.

By evaluating the technical documentation of the locomotives already available in other countries it is possible to free a large part of the construction force. This can then be used in a common effort for improving the individual subassemblies and power plants available both for new, modern construction of traction stock and for assemblies. At the present time diesel locomotives and motor cars are often fitted with engines which do not completely satisfy current technical and economic requirements of diesel locomotive building. Some diesel locomotives have no gas turbo-supercharging; they are not economical enough; they are very heavy; they need special types of fuels; and they have no adequate power reserve.

For diesel locomotives of a fairly low rating, electric rather than hydraulic transmission will be used. Such a transmission is lighter and uses fewer nonferrous metals.

The trucks of an electric locomotive are often too heavy and they are inefficient in their production and operation (bar frames and bolt fastening are used, etc.). The electric locomotives are not stable enough in operation.

The voltage of control circuits ranges from 24 to 110 volts, making necessary control equipment for contactors, relays, signals, various lights, etc.

If the principle of standardization is not met in the construction and subassemblies of diesel locomotives being developed, of electric locomotives, and electric and diesel motor cars and passenger cars, then there will arise a situation where much time and expense will be used in planning and maintenance of new construction; this will raise the production cost of the traction rolling stock. It is hoped that diesel and electric locomotives and motor cars will be supplied to the railroads of several countries not only by their domestic industries, but also by other countries. However, a multiplicity of traction stock types with varying components and equipment will lead to difficulties in operation, in spare

part supply, and in locomotive repair.

A complication of the experiences with the diesel and electric locomotives in production and in operation and the results of scientific research which has been conducted afford an opportunity to choose and standardize the best construction for locomotives and subassemblies. Important and pressing questions are increasingly coming to the fore about the coordination of plans for locomotive building, specialization in production, standardization of types, subassemblies and components of traction stock, and standardization of equipment and locomotive control apparatus.

Extensive standardization of the most important assemblies and components will make it possible to accelerate the series production of electric and diesel locomotives and motor cars. It will also make it possible to lower production costs by the use of more efficient special equipment, more economical rolled sections, and more advanced technology. It would be practical to equip diesel locomotives and rail motor cars with interchangeable engines which also have interchangeable subassemblies and components.

Further, it would be desirable to produce a series of standardized hydraulic transmissions which can be used in diesel locomotives of different types (shunting, passenger, and freight) by exchanging gear wheels. There are hypotheses available on the standardization of trucks, wheel sets, axle bushings and other mechanical section subassemblies and parts, control apparatus, auxiliary equipment and brake parts.

A primary consideration is the standardization of the control circuit voltage for controls and illumination. The standardization of the electric apparatus for electric locomotives was begun by the Eighth Commission of the OSShD Committee. The railways and an electric locomotive building plant in the GDR are producing the technical documentation for a standardized electropneumatic contactor for electric traction stock.

The decision to work on the standardization of diesel locomotive subassemblies was made at the 1959 session of the Third Section for Transport Machine Building of the RGW Standing Commission for Machine Building. To be sure, this is but the beginning of extensive work which must be undertaken jointly by the railroads and the plants of the machine building industry. The socialist plan makes it possible to coordinate the development of the individual branches of the economy, especially in machine building, in the socialist countries. It also makes it possible to avoid unnecessary duplication in planning and producing locomotives of the same types and of other traction stock, progressing instead to the

most extensive specialization and cooperation in production.

Coordination of the economic plans of the socialist countries means mutual agreement on the development of the most important economic branches; this agreement is arrived at on the basis of good will and equality of participating sides, and has as its goal the fastest rate of development of the production of the socialist camp as a whole and of each country separately. The coordination of the economic plans of the socialist countries makes it possible for each country to employ its productive capacities and working force most rationally, to use its investments efficiently, to view better concrete conditions for the development of its own economy in conjunction with the needs of friendly countries, to assure the highest possible mass production, to raise its technical level and to reduce production costs.

The work done by the RGW last year on the coordination of the perspective of the economic plans of the socialist countries is of very great significance. There are relatively narrow opportunities for the development in each country of technical large-scale production aimed at mass or series production of diesel and electric locomotives and motor car trains. Solving the problem of creating in a short time a modern industry for the building of traction stock requires a considerable outlay of time and means. However, under the conditions of the socialist world system, this problem is being successfully solved by the ever increasing distribution of effort within the socialist camp. It is no longer necessary for each country to establish its own locomotive and car building industry. In fact, it would be economically impractical if each country were to build all the types of electric and diesel locomotives and motor car trains needed by its own transport sector, most especially its needs for such equipment are not great.

Specialization is the most effective form for the organization of modern industrial production. Concentrating the production of locomotives and other traction stock in large plants assures mass production standards and effective utilization of high-capacity special machinery and of automatic machines and production lines. It also creates conditions for the introduction of more effective means for complex mechanization and automation in production processes. The expenditure of effort and the net cost of production in specialized plants is much less than in non-specialized plants.

Specialization and cooperation in production lead to the full utilization of production capacities in industrial plants and also to a decrease in production costs

while increasing productivity. They are the greatest sources for increasing output with minimum capital outlay.

Those plants are most advanced technically and economically which are intended for mass- and series-production and which assume a market capable of absorbing their production. The establishment of such plants will be greatly facilitated by the existence of an international specialization of production and by an exchange among the individual countries of the production of specialized branches of industry.

In specializing the production of the individual socialist countries both the needs of these countries and also the needs of all the other countries will be considered.

Specialization in the production of traction stock is economically advantageous not only for those countries where the particular types are produced, but also for the countries which absorb this production. Such specialization makes it possible to expand the scope of productive output, to accelerate the supply of traction stock to the transport sectors, to reduce production costs and to raise the technical level of the traction stock. The delivery of goods between socialist countries is made according to prices based on world market prices. Therefore, it is of great importance to compare the technical levels of the diesel and electric locomotives and motor trains produced in socialist countries with the best of the world level, and to compare production costs in the individual countries.

To bring about the international distribution of labor within the socialist camp it is necessary to prepare and coordinate the economic plans of the individual countries for a fairly long period (10 to 15 years) to prevent specialized plants from being confronted with the danger that their consumers will not absorb their production. In the specialization of the planning and production of diesel and electric locomotives and motor car trains it is especially important to decide what is to be the trend of traction requirements, to choose the types of electric and diesel stock, and to decide how the needs of the railroads of each country are to be met over a long period. By means of such work the RGW Commission for Machine Building and its Third Section for Transport Machine Building can decide the question of specialization of production for a long period. At the 1958 Session of the Eighth Commission of the OSShD Committee a decision was made to work on the standardization of the parameters of diesel locomotives which are being considered for use under various operating conditions on the OSShD railroads. Based on the parameters supplied by the member railroads, an outline of the diesel locomotive parameter was prepared and presented to the Third Section for Transport Machine Building

in order to test the question of specialization in diesel locomotive production.

Standardized parameters for a 25 kv, 50 cps AC locomotive and for diesel motor trains designed for various operating conditions were prepared at the 1959 session of the Eighth Commission. Thus began the great work of standardizing the parameters and construction of subassemblies and components of traction rolling stock for the OSSHd railroads. This work must now proceed with close cooperation between the RGW Standing Commissions for Machine Building and for Transport and the OSSHd Committee for Rail Transport. It is very important to the individual railways that this problem be solved not only with regard to traction stock, but also with regard to the production of care, line building machinery and remote signalling equipment for the OSSHd railroads.

II. EFFECTIVE MEASURES TO REDUCE THE TARE OF RAILROAD CARS

Pages 4 - 7

Diplomat. Eng. R. Gutter,
Chairman of the Sixth
Commission

The problem of building light-weight vehicles - one with which designers all over the world have wrestled for a long time - has very great significance for all highway and rail vehicles and aircraft in the socialist transport sector. Light-weight construction has become an absolute necessity not only from an operational standpoint, but even more in regard to power economy and material outlay.

The profile of railway rolling stock has changed little since railways came into existence. In practice, the old mail coach served both as model and prototype in railway car construction. So far as static or dynamic stresses were concerned, the car frame - whether passenger or freight - was regarded only as a carrying agent on two supports.

The car represented a mobile transport container which was built more or less heavily according to its intended use.

Mixed steel-wood construction has been in use for a relatively long time, and can still be observed today, especially in the freight cars built before the Second World War. Since at that time bolt and rivet fastening was the rule, rail car bodies, especially four-axle passenger cars with their great quantities of wood paneling and cast iron parts (baggage racks, heating pipes, etc.), were so heavy that often the tare of the cars was 50 tons or more. A heavy rail car required an undercarriage dimensioned accordingly; where support distances (distances between truck centers) are large with a correspondingly large flexing moment, intermediate strengthening was often required.

Another result was that the trucks of such cars which also were fabricated using bolts or rivets, were very heavy. Almost without exception, the suspension of such trucks consisted of leaf springs, use a great deal of material and add considerable weight.

As in other machine building branches, the introduction of welding technology into the rail car building industry was a revolutionary event. Most especially, the numerous variations in electric welding made it possible to reduce weights immediately since the overlaps needed previously for bolts and rivets were done away with. The further development of welding technology brought forth aluminum welding, the numerous processes of which are already well-known. This and the development of many aluminum alloys, the mechanical properties

of which are only slightly below those of steel, concluded the initial phase of a development upon which is based the light-weight construction of vehicles. Of equal importance were the development of stainless steel alloys and the production of thin-wall rolled and extruded shapes. These made possible the most important variation in light-weight construction, shell and lattice work constructions. Finally, the great number of plastic and hard synthetic products will become an essential part of the construction picture in the future because of their excellent acid and corrosion-resistance. It is not always easy for the designer to adhere to the principles of light-weight construction when he is faced with present-day improvements in travel comforts and safety and operational requirements. Therefore, the designer must always start, in the case of special-purpose or passenger cars, with the car frame or the interior equipment since these weights are determinant factors in the size and weight of the support members. When the remaining equipment, brakes, draftgear and buffers, is added, the complete car is the determinant factor for the size of the trucks. Thus we see, in individual components, which factors are influential. In all these observations the four-axle "high-capacity car" (Grossraunwagen) has been used as a basis because in it the stresses are quite severe, and the difference between light-weight construction and a car built according to the so-called "classical theory" is most evident. Too, the "high-capacity car" in all its variations will play an increasingly greater role in the socialist economy since the standardization of it is in the program of work of the Sixth Commission of the OSShD.

The Passenger Car

The body of a railway passenger car with its interior equipment has been compared in its mission and shape not incorrectly with the fuselage of a modern passenger plane. There is a certain similarity in its height and width and in its types of stress (static and dynamic), and this similarity ends only in the presence of different load points and in the lack of static longitudinal load in buffer compression testing. The principles of light-weight construction were put into practice much earlier in the aircraft industry. Here the need was more pressing because light weight influences directly the capacity and operation radius of the aircraft.

These experiences have led to a basic departure from the "classical car building theory". The whole car body, including the truck, has been developed as a self-supporting closed tube which is sufficiently buckle-resistant to absorb the dynamic loads of the truck. Experience has shown that the

great moment of resistance which the car represents to these loads will be formed by the whole of the light-weight car - the underframe, the roof and side-walls - and that it is correspondingly torsion-resistant. The side walls are firm by virtue of their construction and can be treated, in view of their window openings, only as thin-walled support members. In normal construction standards of 60 mm side-wall thickness, either stamped or corrugated plates 2 mm thick are used. There is a possibility of designing underframes and roofs with diagonal trussing and roof supports with greater cross-sections by using hollow frame construction. The floor will be covered with a steel sheet corrugated along the length of the car and fastened to the underframe, thus absorbing and distributing load pressure. This type of construction is especially buckle-resistant.

If non-corrosion-resistant steels such as St 37 and St 52 are used, then paint becomes quite important. Soviet data show a progressive annual corrosion of 0.025 to 0.05 mm on the lower part of window panels and up to 0.06 mm on the diagonal trussing under the windows.

In construction using a single material, either steel or aluminum (aluminum alloys such as Al Mg Si), difficulties arise in buffer compression tests, conducted at 2 X 100 tons on both sides and 40 tons diametrically, due to the fact that the longitudinal axis of gravity does not coincide with the direction of buffer compression, as it should ideally, but instead lies closer to the middle of the car. Under these circumstances, the designer is forced to consider strengthening the underframe, something not required by the vertical load.

In steel-aluminum construction, using steel mostly for the underframe, the static gravitational axis, because of the weight differential of steel to aluminum (3:1), is correspondingly lower and closer to the direction of the buffer compression.

Because of its light weight, the use of aluminum is attractive. While, for instance, a steel car door will weigh 50 kg, one of aluminum will weigh only 15 kg. This alone amounts to a weight saving of 140 kg ($50 - 15 \times 4$) per car. And there is also the exceptional corrosion-resistance of aluminum to be considered.

Just by omitting painting, 300 to 400 kg of smoother and paint would be saved, not to mention the annual painting costs.

For the interior equipment of cars, wherein both sleeper and dining cars are included and are concerned equally, plastics afford a wide area of application. They could be used as heat insulation in the future in our air-conditioned and air-cooled cars, or as sound-absorbing material (flooring, ceilings, walls,

etc.) in cars which tend to drone when fabricated of plates, or as foam rubber in upholstery, seats and flooring. They could also be used for all of the interior fittings of the toilets, wash rooms, and to some extent in the compartments, as well as many other places.

In any case, when compared to steel, malleable iron and brass, aluminum offers significant savings in weight.

A somewhat lower car weight can be attained by introducing automatic central bugger couplings in place of lateral buffers and by using much lighter buffer boards.

The use of cast iron and thick-wall sheet metal tubes for heating was discontinued some time ago. The introduction of low-pressure circulatory heating has already made it possible to use rigid, thin-wall sheet metal tubes which can be kept to a very small diameter, while at the same time providing an excellent transfer of heat by enlarging the heating surfaces by the use of thin plates or corrugated bands attached to the tubes. In outfitting cars light-weight construction will also have to deal with new equipment and units which up to now have not been standard equipment, such as air conditioning, air cooling, etc., for long-distance cars.

All these partially heavy pieces of equipment can cancel out savings in weight if they are not harmoniously and efficiently fitted into the cars and included in the supporting members whenever possible.

The old-type truck shown in Figure 1 has already dropped from use because of its robust rivet construction and the arrangement of the heavy leaf springs mentioned earlier. Further development of a light-weight truck frame progressed from the welded, and later pressed, type to a truck without axle guards and with helical springs and roller bearings introduced in the last few years.

The truck without axle guards shown in Figure 2 is of the Gorlitz type and, when contrasted to Figure 1, shows well the results which can be obtained with light-weight construction. Now such problems as, for instance, rubber suspensions, which unquestionably would result in further savings in weight, await technical and practical solutions.

The wheel set, when one considers the development from spoke wheels to pressed wheel disks, shows how slight changes affect both weight and form.

Another saving in weight would be in reducing the diameter of wheels if this is not ruled out on practical grounds, such as observing a minimum wheel diameter for passing unmanned switch crossings. The use of wheel disks made of light metal or pressed from thin sheet with a high moment of resistance presents another possibility for reducing the weight of the wheel set. And still another possibility is in the use of

hollow shafts; the technical difficulties in preparing such a shaft and the special relationship of problems of strength in regard to wheel seats will not be gone into here.

The increase of speeds and the necessary enlarging of the brake system, which must withstand 200 or more percent of the static wheel load at high speeds (over 120 km/h), naturally required larger brake cylinders and rod-linkage, including brake shoes. However, if the weight of a heavy 45-ton car can be reduced to 30 tons, then the braking power of the car can be reduced without impairing the high braking required. The brake cylinder would be considerably smaller in size and thinner-walled in construction and the whole brake gear would be, as a result of the lesser forces acting on it, lighter, safer, and also simpler since the possibilities of using light metals would be favored.

The German State Railways as early as 1937 and 1938 began research on light-weight car building. With materials then available 40-ton car. The distribution of the weights of the two cars is shown in Figure 3. This figure shows impressively not only the weight distribution of the individual subassemblies; it also shows the quite variable percentage relationships of the light-weight car. As has been mentioned above, in the case of wheel sets and interior equipment the percentage of weight in the light-weight construction car did not decline proportionately, even though these same assemblies represent the greatest percentages of the total weight of the car.

Figure 4 shows what course of development has been taken in a typical specific index of weights of passenger car seats. The values given therein can be compared only conditionally since another principle of construction is used in double-decker cars. It must be borne in mind that whether one divides light-weight construction by seat weight or by meter weight, only the same types of cars intended for the same use can be compared.

In the case of the German State Railways, the double-decker car, which also utilizes self-supporting construction, has contributed, especially in industrial areas, to the smooth development of heavy commuter traffic in the target period (Schichtzeit). The use of double-decker cars makes possible at last the formation of relatively light, high-speed trains in areas where there is a high train density.

Freight Cars

In principle, the light-weight construction of freight cars is the same as in passenger cars except that there are other relationships in regard to the car body. In platform

and depressed-center cars (special-purpose cars) one cannot avoid placing the supporting construction in the underframe. As a result, welding techniques cause us to strengthen the longitudinal support at the point of the greatest moment of flexure, because of the principle of support members of equal rigidity; this registers a weight reduction compared to the old rivet and intermediate trestle construction.

In open cars the inclusion of the side walls in the support construction is only hypothetically possible because the door openings represent a break. In recent years the all-steel car was developed to save wood. There was a common tendency to use corrugated and form-pressed sheet parts in this car; these parts increased torsion- and buckle-resistance considerably. Corrugated flooring plates with thin wood inserts were also used.

In the development of four-axle open cars, the German State Railways listed the following values in the development of tare:capacity characteristics:

Year of Construction	Type of Construction	Characteristic Value
1952	Wood	0.377
1956	Steel	0.355
1958	Steel	0.340
1959	Steel	0.333

There is no doubt that the use of light metal alloys for the framework and the support members - with hollow supports and shell and box construction - plus the use of synthetic materials for the covering of all kinds of box-type cars will result in further weight reductions, and the expenditure of energy per ton in pulling trains will decline even more.

The trend in refrigerator and covered car construction is analogous to that of a passenger car up to the point of the higher capacity and smaller distances between truck centers of freight cars. The Polish State Railways, at a recent rolling stock exhibition in Warsaw, presented an interesting solution to the problem of roof construction. The roof of a two-axle car was covered with transparent arched plastic plate four to five mm thick. Such construction has two advantages: one, the saving of weight on a supporting element, and two, its transparency. The car had already been in operation two years with no complaint about the serviceability of the plastic plate.

The tank car has already lost its underframe in the interests of light-weight construction. The tank, with its high moment of resistance, serves as the connection between the two trucks. The buffer board is mounted on the tank by means

of diagonal braces in order to transfer well the buff forces to the tank.

In the above article there have been mentioned a few of the essential factors which are influential in realizing light-weight construction.

FIGURE APPENDIX

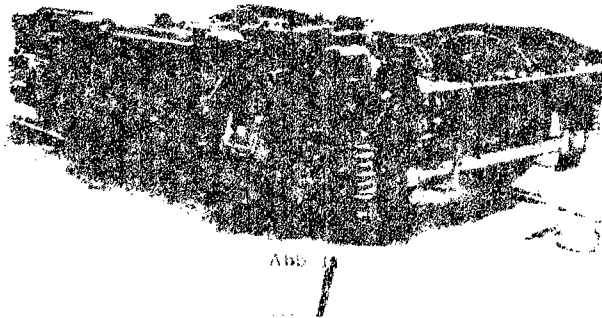


Figure 1.



Figure 2.

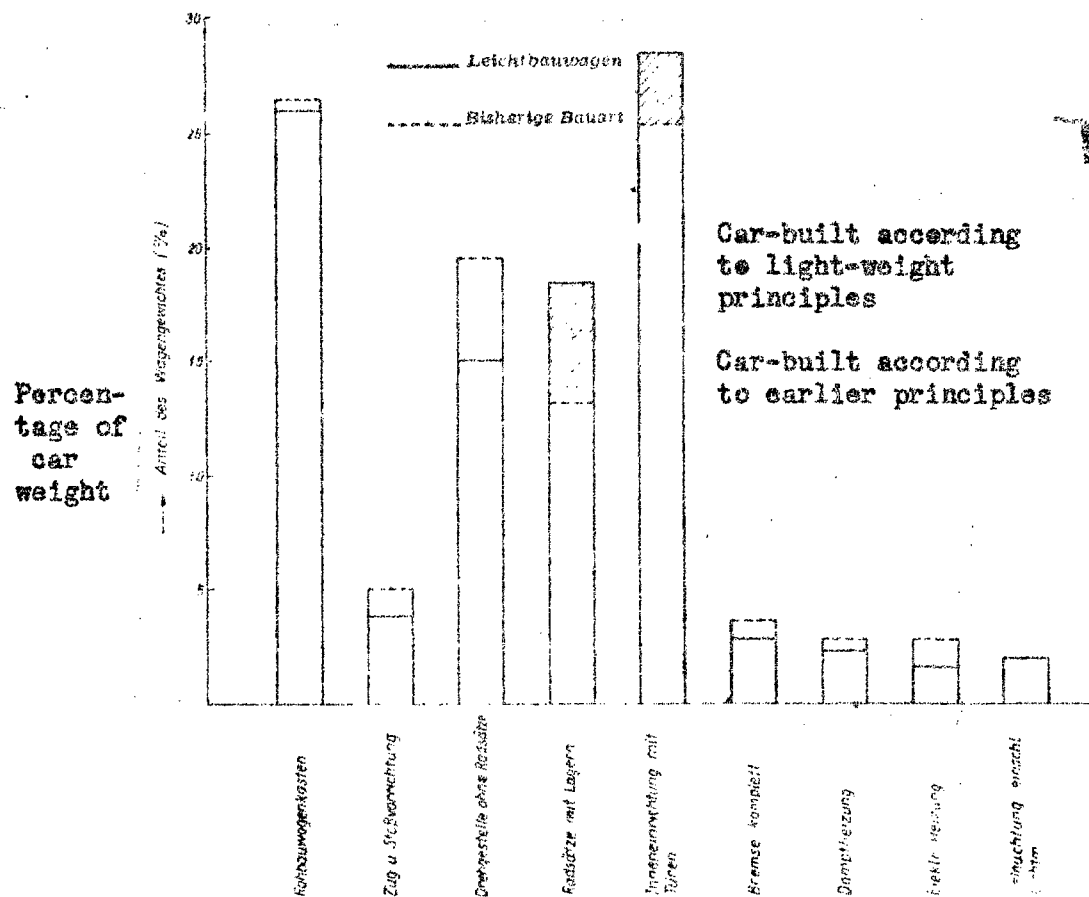


Abb. 3

Car
body
frame-
work

Draft
and
Buffing
gear

Truck,
without
wheel
set

Wheel
set,
with
bearings

Inter-
Equip-
ment
with
doors

Brake
gear,
com-
plete

Steam
heat-
ing

Elec- Illumina-
tric tion,
heat-including
ing generator

Figure 3.

Seat
Weight
(kg/seat)

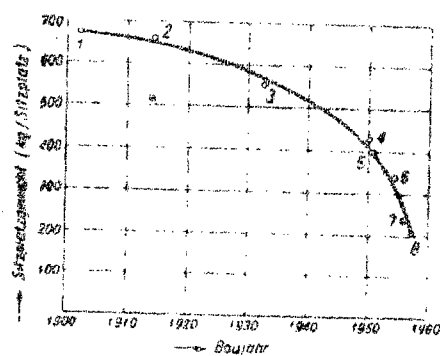


Abb. 4

Year of Construction

Figure 4

III. SMALL-SCALE MECHANIZATION OF MAINTENANCE OF WAY

Pages 8 - 11

Eng. U. Tschen-San.
Chairman of the Ninth
Commission, and
Diplomat, Eng. Christa
Gartner,
Counsel of the Ninth
Commission

Establishing and maintaining a railroad way is laborious and difficult and mechanization of this work is urgently needed. The large equipment used previously has proven itself well in new construction or in maintaining fairly large sections; however, the use of such machines requires periodic line blockage. Nonetheless, mechanization in the continuing maintenance of the lines is an urgent matter. Small machines are needed so that work can progress between trains without blocking the line.

Such small machines are available and they can be used effectively by the smallest unit, the brigade, thereby satisfying a great economic need. At the same time, small-scale mechanization is an effective measure against the shortage of labor prevalent in some socialist countries, and it reduces considerably the amount of heavy manual labor.

In keeping with the character of maintenance work, the small machines must be able to be placed on the track and removed from it quickly. Among other requirements are the lowest possible weight, ease of handling and operation without regard to clearance. Only under these conditions can the hopes for the elimination of heavy manual labor and for the greatest possible economic utilization in railway maintenance be satisfied.

In addition to the machines for large-scale mechanization, small machines have also been developed. The OSShD railroads have conducted joint scientific and practical work in order to produce as quickly as possible the machines needed. The development in the socialist countries has progressed so well that production in the individual countries or an exchange of technical documentation between the individual countries has already taken place. The results to date are reflected in the equipment which has been recommended and the machines which have already been introduced.

However, a progressive technology demands constant development. Therefore, small-scale mechanization must still receive great attention in the future.

Tamping Machines

In the present state of the art there are three basic systems: electric vibrational tie tampers (see Figure 1), electric impact tie tampers (see Figure 2)), and tampers powered by their own internal combustion engines. The first two systems are the most wide-spread.

Two vibration tie tampers (type E Sch P-3, SZD (Sovetskiye Zheleznnye Dorogy - Soviet State Railways) and type EVP -353, CSD (Ceskoslovenske Statne Drahy - Czechoslovak State Railways)) and one impact tie tamper (type EP-8, CSD) have been tested and recommended to OSSHD railways for their introduction into service.

Asynchronous electric motors with short armature arrangements and an output of 0.25 to 0.4 kw are needed for vibration tampers. The number of vibrations per minute is 2800 or 2920. Including cable, the machine weighs about 25 kg. At 920 impacts per minute the impact load is 1.8 kgm. The tampers mentioned are suitable for tamping wood, reinforced concrete and steel sleepers.

Compared to manual operations, the use of the machines requires 60% less work time, and the quality of the work where a one-man tamper is used is significantly higher than in hand tamping. See Figure 3.

Mobile Small Tamping Machines for Two-Rail Operation (Type REW, DR (Deutsche Reichsbahn - German State Railways))

The following components make up the small hydraulic tamping machine (see Figure 4):

- 1 carriage (frame construction)
- 2 small tampers (one for each rail)
- 2 driving motors
- 2 lowering units (Aussetzvorrichtung)
- 2 loading skids
- 2 devices for protection from the weather

The weight of the two small tampers is 940 kg and the weight of the complete unit is 1280 kg. A six-hp combustion engine is used for power.

The small tamping machine is lowered with the tamping arms extended, the tampers grip the ballast and press it under the sleeper as the arms are closed. The vibrations resulting from this increases the compression.

The tamping capacity of the machine is about 120 sleepers per hour. A two-man crew is needed.

Boring and Tapping Machine for Screw Spikes, with Universal Drive (CSD)

CSD operational experiences have shown that this type of machine using a fluid drive has an advantage over one using a mechanical drive. It has a smooth and uninterrupted action, and the thread direction can be changed instantly. Too, the drive motor will not be overtaxed by the frequent changes of the moment of rotation. The capacity of a machine with hydraulic transmission is almost 100% more than one with mechanical transmission. About 5 seconds is needed to tap a T2 spike into hard wood (135 mm shaft length).

In order to produce the special fluid drive more economically, a universal drive unit was developed with variable revolutions and moments of rotation. This unit can be built as a basic unit for single- and multiple-purpose equipment. Figure 5 shows the power unit described used on a small car built for various purposes.

The weight of the power unit is about 100 kg for a single-purpose machine and 150 kg for a multiple-purpose machine.

Since special value is attached to low weight, the use of equipment with divided functions is an advantage.

Rail Boring Machine (Type REW, DR)

The drive of this machine uses a flexible drive shaft and an internal combustion engine (4 hp) or an electric motor (3.5 kw). The driving motor is fastened to a special supporting frame.

The total weight of this machine, consisting of a boring head, boring bracket, and a lubricant container, is about 36 kg. The boring head consists of a separated aluminum housing. In the upper part of the housing there is a worm drive reducing the drive revolutions from 3000 rpm to 193 rpm. Beyond the worm drive, bevel gears reduce the revolutions further to 160 rpm (drill spindle revolutions).

The flexible shaft, - the transmission element from the motor to the small machine - is made up of a steel wire core covered by a flexible protective tube. The diameter of the shaft is about 20 mm.

The capacity of this electric boring machine is 15 to 20 times greater than that of a hand drill. About 45 to 60 seconds are required for one flange boring.

Rail Aligning Machine (SZD)

The motorized rail aligning machine (Gleisrichtgerät) with inclined cylinder shown in Figure 6 has a 2.4 hp internal combustion engine. The machine develops a maximum pressure of 9,000 kg on the operating rod; the range of the operating rod is 665 mm. It weighs 190 kg and covers - in two-man operation - 1900 m per shift.

Gap Regulating Machine (RN-01)

This two-cylinder machine works hydraulically and serves primarily to produce gaps to allow for temperature changes. The machine, with a weight of 78 kg, develops a force of 25,000 kg. In pressing the rails apart a speed of 80 mm per minute is reached; the rails can be pressed apart as far as 150 mm in one sequence of operation. A two-man crew is needed.

Equipment for Replacing Old Rails with New (PKP Polish State Railways)

This equipment can be used for rails of fairly great length. It requires two trucks with guide rollers for the rails and a 40- to 60-hp locomotive operating a 3 km per hour.

The two trucks with variable-height guide rollers are connected by a wire rope about 15 m long. The first truck hoists the new rails, already laid sideways, and puts them on the tie plates in place of the old rails which are being removed.

The second truck moves onto the newly-laid rails. The old rails are lifted from the tie plate and, by means of the guide shaft, are removed.

The second truck moves onto the newly-laid rails. The old rails are lifted from the tie plate and, by means of the guide shaft, are removed sideways from the line. Manually-operated portal cranes are needed for placing the rails by hand, this new equipment increases capacity greatly. It results in a time saving of 75 to 85%.

Thus far, several machines have been announced or recommended for introduction into service by the OSShD railroads. But, beyond these, there are in successful operation rail-grinding and cutting machines, equipment for transporting and laying long rails, smaller machines for laying reinforced concrete sleepers and portable line sections,

rail testing equipment of various kinds and spike driving and pulling machines.

Too, small cars with power drive are proving effective on line maintenance; among these, especially the powered gang car (possibly with a crane and trailer) is a universal piece of equipment. There is no doubt that it is impossible to produce promptly these new machines in the required numbers in every country. Therefore, a transitional solution must be found.

Semimechanization

Since the beginning of the Great Leap Forward in the Chinese Peoples Republic, a very great part of line maintenance work, beyond that which has been completely mechanized, has been semimechanized. By means of this semimechanization heavy manual labor has declined without putting into operation electrical and other equipment. Mentioned below are a few of the successful types which have been used in the Chinese Peoples Republic.

For instance, two types of tie tamping were used, chain tamping (see Figure 7) and roller tamping. Chains are mounted on a portable metal frame about 1.20 m high; tamping tools, each weighing about 8 kg, are suspended from the chains. For the tamping of one sleeper two frames are mounted together. The tamping tools fastened to the chains are raised together to a height of 0.5 m and then dropped. In contrast to previous methods, this method allows the workers to stand upright. Output is increased by about 50%..

By varying the combinations or by using supplementary equipment, this chain tamper can be used for cleaning, spreading and tamping ballast down. The frame also serves as a base for transporting the equipment.

For bed clearing two types of tools are used, a one-man lever type and a two-man lever type. One kind of ballast fork has a brace at the height of the rail and this brace fits firmly on the railhead. A lever effect is produced at this brace point, facilitating the work. The fork is worked along the rails and the ballast is cleared from between the sleepers. This method is about 25% more efficient than clearing by hand. Throwing the ballast back onto the line is done in a similar manner; efficiency is increased by about 20 %.

Thus, in addition to complete mechanization, simple machines and methods will serve as a transitional solution in bypassing heavy manual labor in railway maintenance. To this end, the OSShD railways are exchanging their ideas and designs in close cooperation in order to improve mutually the technology of line maintenance.

FIGURE APPENDIX

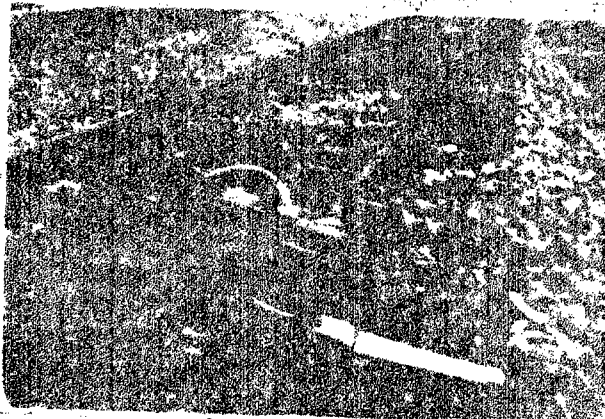


Figure 1

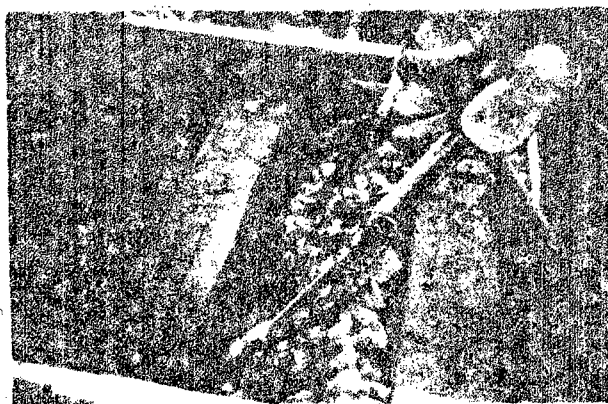


Figure 2

Schnellere Senkung nach der Stopfung

100%	100%	100%	100%
66%	63%	60%	59%
nach 3 Zugfahrten	nach 72 Zugfahrten	nach 252 Zugfahrten	nach 3200 Zugfahrten
manuell (100%)		maschinell	

The Settling After Tamping

100%	100%	100%	100%
64%	63%	60%	59%
After 3 train passings	After 72 train passings	After 252 train passings	After 3,200 train passings
manual tamping (100%)		machine tamping	

Figure 3.

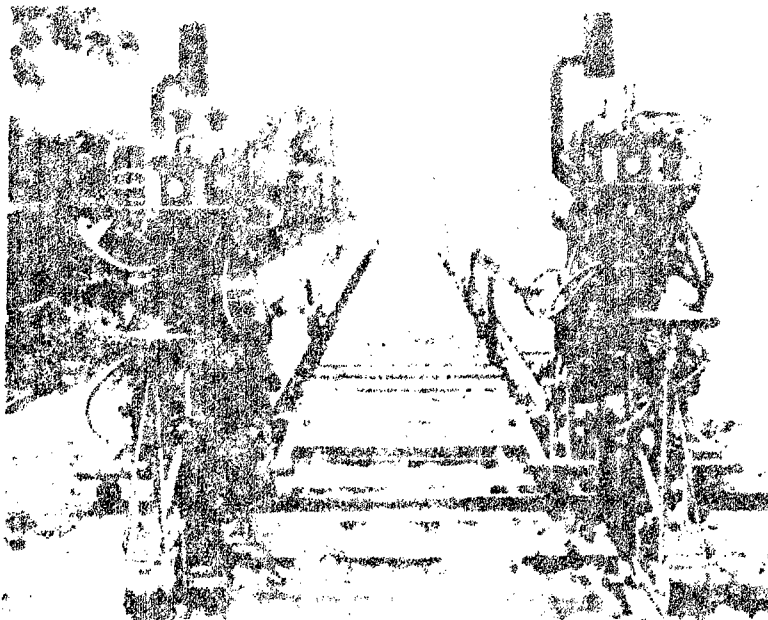


Figure 4.

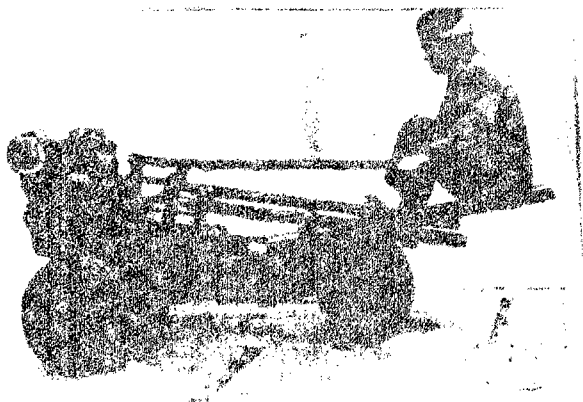


Figure 5

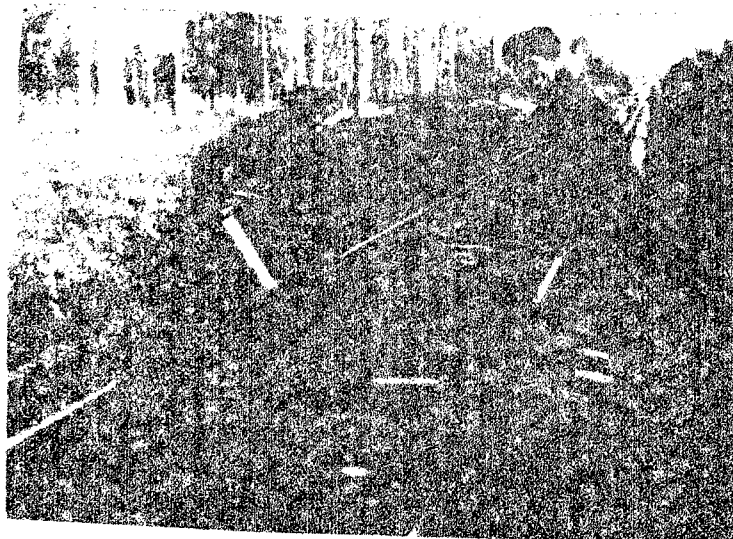


Figure 6

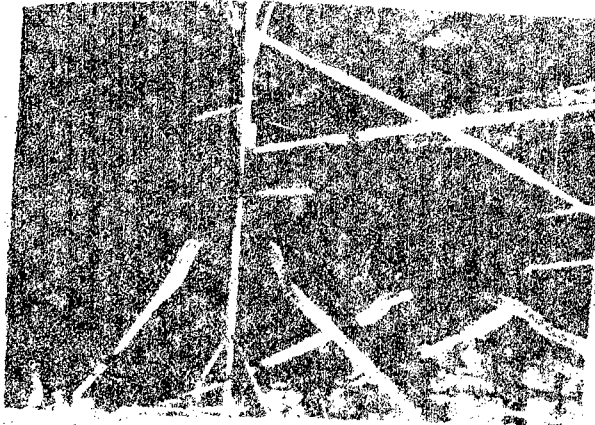


Figure 7

IV. SOME EXPERIENCES CONCERNING LONG-DISTANCE HIGHWAY
FREIGHT TRANSPORTATION USING THE PRIME MOVER EXCHANGE
FE SYSTEM

Pages 12 - 14

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Regular centralized public long-distance truck transport of goods was first begun in the RSFSR in December 1957 on the Moscow-Ryazan' and Moscow-Kalinin highways over a route totalling over 350 km.

The scope of the transports was still very limited at that time and amounted to scarcely 21.3 thousand tons on both stretches in the first three months. When compared to the long-distance goods transports undertaken by various authorities with their own transport equipment, regular public long-distance highway goods transport has several advantages from the start. Among these are: guarantees of loads in both directions for 90% of the vehicles in use, the opportunity for rational use of trucks of fairly large capacities, and long-distance truck-trailer combinations (trucks with trailers or saddle tractors with semitrailers), planned transports, and by no means last, a substantial reduction in net cost.

Regular long-distance highway transports rose quickly in the course of the last two years. In 1958 the number of truck-trailer combinations in operation was 206,000, the quantity of goods transported was 1,000,000 tons, and the work done was 191 million ton-kilometers. In 1959, 821,000 truck-trailer combinations were in use, 3.3 million tons of goods were transported, and an efficiency of 718 million ton-kilometers was reached.

By the beginning of 1959 the total length of the highways in the RSFSR on which regular long-distance goods transports were operating had already risen to 13,000 km. At this time 133 goods acceptance-dispatch points, including 38 trucking freight stations, had been opened. By March of 1960 the total length of highways in use was already over 20,000 km and there were over 200 goods acceptance-dispatch points, including 50 trucking freight stations, in operation.

The experience now available in regular long-distance highway goods transport make it possible to establish guide lines for its completion and also to eliminate the shortcomings which arise from the so-called through transport system over long distances.

In the system previously used the goods were driven by one or two drivers from the point of origin to the destination in the same truck or truck-trailer combination. If these transports were over distances of 500 to 800 km or more, then the drivers were subjected to abnormal working conditions. They were en route five to seven days and were out of touch with their home office, and opportunities for the required rest periods were not always available. Beyond this, the technical care of the vehicles was not adequate. There were long delays at the points where the goods were loaded and unloaded and this led to an unproductive utilization of the truck part. In addition, qualitative control of the transport was made more difficult and, because of the long period when the vehicles and the drivers were outside the home office area, transport performance indices and maintenance of the vehicle park were unfavorable.

By means of a new method of exchanging prime movers these deficiencies are being avoided in regular centralized long-distance highway goods transport. By this method the goods are transported from point of origin to point of destination in a semitrailer drawn by a saddle tractor. The tractor is exchanged enroute on each section of the route.

This new method was first used in the RSFSR in regular goods transport in November 1959 between Moscow and Leningrad. It was introduced on a test basis and had a narrow scope. Two truck-trailer combinations consisting of GAZ tractor trucks and PAZ-744 semitrailers were put into daily operation out of Moscow and Leningrad.

The PAZ-744 semitrailer has an all-metal body, carries a payload of 4,000 kg and has a tare of 1,850 kg.

The Moscow-Leningrad highway with a total length of 725 km was divided into four sections:

Moscow - Kalinin	169 km
Kalinin - Vishnij Volochek	131 km
Vishnij Volochek - Novgorod	231 km
Novgorod - Leningrad	194 km

On each of these sections the trailer was pulled by a different tractor. On the Moscow - Kalinin section it was under the control of the Vehicle Economy Section of the Moscow Main Motor Transport Administration. On the Kalinin - Vishnij Volochek and Vishnij Volochek - Novgorod sections tractors from the Motor Transport Column (Kolonne) No. 74 of the Kalinin Motor Trust were used, and on the Novgorod - Leningrad section the trailers were pulled by tractors belonging to the Leningrad

Motor Transport Administration. The tractors were changed in Kalinin, Vishnij Volochek and Novgorod.

In working out the graphic transport plan the simultaneous arrival of the trucks at the exchange points from Moscow and from Leningrad was provided for. In this way the tractors were assured of having trailers in both directions on their section. The transport plan provided for an equal expenditure of time in both directions for trucks driving from Leningrad and from Moscow. The actual driving time was 20 hours, corresponding to a technical average speed of 36 km per hour. One hour was allotted for the transfer points of Kalinin, Vishnij Volochek and Novgorod for the purpose of changing prime movers, handling the formalities and providing a short rest for the drivers. In this way a period of 23 hours was required for the movement of a trailer from Moscow to Leningrad and back, giving a speed of 31.5 km per hour. A layover of two hours in Vishnij Volochek was provided for truck-trailer runs No. 3 and No. 4; this guaranteed that these runs would meet runs No. 1 and No. 2 in Kalinin and Novgorod. In spite of the longer layover, these runs also attained a speed of 30 km per hour. The transport plan as shown in the drawing below shows this new method especially well. With the introduction of these transports a new order has been established in the performance of long-distance highway goods transport. It has been established that the goods could be transported under the following conditions:

1. the goods must be sealed in the body of the trailer or in containers sealed by the dispatcher or the trucking freight station;
2. the goods must be in large quantities;
3. crated goods (Tara-Verpackungsguter) are required so that unloading is not necessary in acceptance and dispatch at the points where the tractor is changed;
4. goods must be escorted from the forwarder to the trucking station.

TRANSIT PLAN

For Truck-Tractor Combinations Using The Prime Mover Exchange

Method On The Moscow - Leningrad Route

Run No. 2

Run No. 4

Leningrad
194 km

Novgorod
231 km

Vishnij Volochek
131 km

Kalinin
169 km

Moscow

Run No. 1

Run No. 4

Route out of Moscow

Motor Transport Column No. 74
Tractors

Route out of Leningrad

Vishnij Volochek Disposition
Point (Einsatzort)

Moscow Motor Transport
Administration Tractors

Leningrad Motor Transport
Administration Tractors

As a rule, the trucking station will serve as the final destination of the trailers. The delivery of the trailer by the long-distance tractor directly to the warehouse of the receiver at the destination is to be regarded only as an exception.
The exceptions are:

1. that the receiver has a loaded trailer ready for the return trip, and
2. that the warehouse of the receiver is no more than 5 km from the trucking freight station and can be reached by telephone.

In the first instance the tractor can set out for the trucking freight station promptly without having to wait for unloading.

In the second case the short distance and the telephone connection rules out the risk of a delay at the receiver point, and the execution of the next step in the long-distance transport is not endangered.

Normally, the trailers ready for loading or unloading will be moved to receivers or from dispatchers by tractors belonging to the trucking station.

This method will also require changes in the exchange of forwarding documents. To this end a detailed declaration of the goods sealed into the trailer by the sender or by the trucking station will accompany the shipment in a bin built onto the trailer body. In addition, escort papers are to be drawn up wherein notes will be made concerning the acceptance and transfer of the trailer at the transfer points from one driver to the other. Moreover, the driver is to receive a certificate which confirms for him the transfer of the trailer for further transport.

In order to be able to cover all the transported consignments and the transport work, the transports made are assigned to the participating motor transport units on the basis of the length of the section. This gives the proportion of the distance which the trailer is pulled on each section of the route.

Such a system makes it possible to ascertain the ton-kilometers attained on the whole route and by the individual motor transport units and it reduces the possibility of duplicate reckoning by several transport units. This same thing holds true also for the quantity of goods transported.

There are, however, some variations for solving this problem; for instance, the tons and ton-kilometers might be attributed only to the motor transport unit owning the trailer and the unit would plan and compute the work of the tractor according to the hours in operation and trip mileage. Another possible variation is that the ton-kilometers would be computed by all the motor transport units in proportion to the distance which they transported the trailer, but that the tons would be computed as transit tons by the intermediate and final transport units.

The payment by the sender is made on the basis of rates established for regular and long-distance highway goods transport. These rates provide that, in the transport of goods weighing up to one ton, a tariff charge will be made for each consignment, and, in the transport of goods weighing over one ton, payment will be made for each ton of the load transported. In both cases the amount of the tariff charge is dependant upon the distance of the transport.

Of interest is the distribution to the individual motor transport units of the payment made by the sender of the goods.

The motor transport unit which owns the trailer receives from 0.25 to 0.65 rubles, depending on the type of trailer, for each kilometer driven.

The motor transport unit which owns the tractor receives 0.95 to 2.65 rubles for each kilometer the tractor is driven.

For the smooth coupling at the intermediate points, the trucking freight stations receive 10 rubles for each new trailer hook-up.

The remainder of the payment is divided equally between the dispatching and receiving trucking stations.

There was no doubt that it was also necessary to establish other standard. These included testing the technical conditions of the trailers, the technical conditions of the sites, illumination at the transfer points, as well as the equipment necessary and the operational materials required, such as brake fluid, spark plugs, etc. at the points. The trucking freight stations were also equipped with ST-35 telegraphic equipment.

In order to assure the operation of two truck-trailer units daily from Moscow and Leningrad, there are in operation on the route eight trailers and seven tractors served by fifteen drivers. The owners of the trailers are the motor transport units at the terminal points, that is Moscow and Leningrad, each of which own four trailers of those in operation. The individual sections of the route are each served by two tractors, except for the Kalinin - Volochek section where only one tractor is used. The driver crew of a tractor consists of two drivers, each working every other day. There is one relief driver to serve the three tractors in use on the Kalinin - Vishnij and Vishnij Volochek - Novgorod sections.

After the trial introduction of this new method, a series of real advantages can already be ascertained:

1. there are normal working conditions for the drivers whereby they return to their homes each day;
2. under the old method with its necessary rest periods, 36 hours were needed for transports between Moscow and Leningrad; the new method reduces delivery time to 24 hours;
3. there is a rational utilization of vehicles through a real reduction in non-driving periods, especially in loading and unloading operations;
4. there are better technical conditions brought about by the planned prompt handling of the returning vehicles;
5. there is an opportunity for constant control in the execution of transports and there is a uniform, strictly

disciplined transport process from beginning to end.

It is already apparent that it is advisable to extend this method. Therefore, plans have been made for the operation daily of six truck-trailer units from Moscow and Leningrad.

Beyond this, more powerful tractors and trailers up to seven-ton capacity should be put into operation. At the moment tests are under way to see whether it would be practical to set up additional hook-up points in accordance with the new method. Strict adherence to the transport plan will affect the results of regular long-distance goods transports; this raises the question of whether a special service for technical aid is needed on the route. The expansion of this new method planned for the Moscow - Leningrad route will provide the conditions necessary to organize this system on other highways.

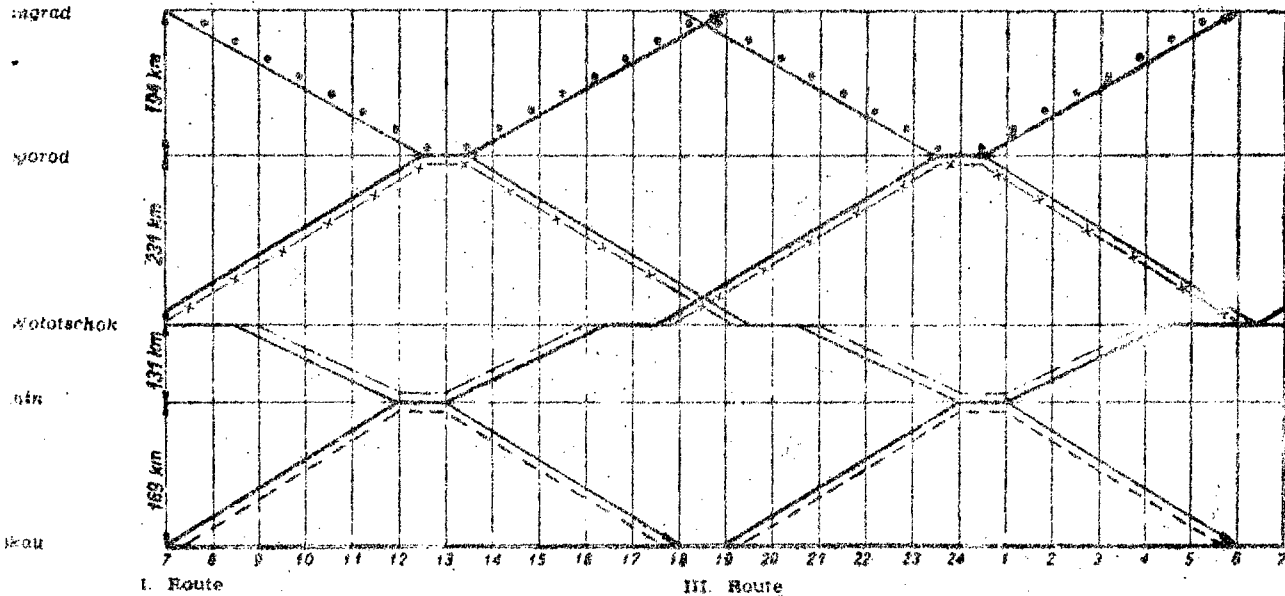
FIGURE APPENDIX

BILDFAHRRPLAN

der Fernlastzüge nach einer neuen Methode (Wechsel der Zugmaschinen) auf der Route — Moskau — Leningrad

II. Route

IV. Route



- Route der Fernlastzüge aus Moskau
- Route der Fernlastzüge aus Leningrad
- Schleppfahrzeuge des Moskauer Kraftfahrzeugbetriebes

- Schleppfahrzeuge der Kraftfahrzeugkolonne Nr. 73
- Einsatzort W. Wolotschok
- Schleppfahrzeuge des Leningrader Kraftfahrzeugbetriebes

V. ESTABLISHMENT OF A TECHNICAL AND ECONOMIC INFORMATION SYSTEM

- AN URGENT OSSHD TASK -

Pages 15 - 17

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The stormy rise of the socialist countries and concurrent developments in science and technology in every branch of the economy are bound together by an enormous, constantly growing literary activity. Without a systematic search of the contents of new technical and economic writings through which the world

The specific conditions of railroading and the many-sided problems of transportation result in the fact that articles dealing with the various technical fields in transportation are not only concentrated in domestic and foreign technical journals of the railways and other carriers, but are also scattered in literary sources for machine building, electrotechnology, construction, chemistry, or even in other fields.

On a world scale there are more than 200 technical publications (books not included) which deal with transportation and which are published more often than once a month. However, there are more than 600 publications published at various intervals, which do not treat transportation matters primarily, but which do deal regularly with transport problems. If we include books, research items, studies, patent notices, brochures of firms, catalogs, etc. - all dealing with transportation matters, then the index is multiplied.

Therefore, it is a very difficult matter to follow this abundance of literature systematically and to fit into the picture the new publications from all over the world concerned with technical advances, research results and patents. Most especially, those who are working on capital investment and planning projects and those engaged in research and development must be well-briefed for a perspective of their work and in order to have a view of the near and distant future. If, for this, they must rely on themselves, then these people will be in no position to orient themselves on the current status of the technology and the economy of their specialty without having their creative work suffer because of it.

Thus, literary and other material must be reviewed, selected and disseminated. In this way the controlling offices, scientists, engineers and economists will be saved precious time.

In order to answer the most exacting questions there should be a technically oriented information service with as systematic and basic an organization as possible.

Recognizing this, many countries have lately given great attention to documentation and information offices. Their activities have become an important factor in scientific research and development work, in the solution of technical and economic problems, and also in the technical and economic publicity used in the plants.

In order to distinguish the functions of these offices, there should be a brief review of their structure and methods of operation.

The technical-economic information offices are made up basically of three sections: the technical library, and the documentation and information sections to which a translation service is often attached.

The technical library has its traditional responsibilities. Its activity is too far-reaching to go into details here. It is the main collection office for literary sources concerned with technical research, the economy, and practical utilizations; it deals almost exclusively with original texts. It works closely with the scientific-technical and economic documentation offices which prepare the secondary sources of information.

Those who deal in documentation check first of all on the suitability of the original source and on whether it should be treated. They then prepare the material in a short format such as brief excerpts, tables, summaries, etc. These secondary sources are then assigned numbers according to the international decimal classification system on the basis of their content and certain characteristics, thereby making it possible to find them quickly and satisfactorily. The sources are then made ready for use.

The sources which are used thus in documentation and which are arranged in a card file still represent a dead fund of knowledge which cannot be fully utilized in this form. The potential of this fund must be made available to the user by means of active scientific information. This brings us to the major branch of activity of these offices - from which they also take their names - namely, that of making information available. In making the accumulated information available. In making the accumulated information useful, the whole documentation and information activity reaches its apex. It should be so organized as to prevent a technician having to deal with a problem in a specific technical area long since solved elsewhere.

In compiling technical and economic information on transportation matters, results in other technical fields must also be evaluated.

We can discern two methods of development within our socialist countries. In several countries a technical-economic information system has been established without the obsolete "classical" documentation tradition preceding it; in others, the already extant network of libraries and documentation offices evolved a new system of technical-economic information as a result of the new requirements which arose from the socialist economies.

The Institute for Technical-Economic Information was established in the USSR in 1933. Following several organizational changes, a broad decentralized information network developed; operating out of the Central Bureaus for Technical-Economic Information it served the individual departments (Ressort), the scientific-technical documentation and information offices of the research institutes, and the technical information bureaus within the plants. Beyond the central organs for technical-economic information, the units most concerned with technical advertising are the House of Technology (Haus Der Technik) and the technical cabinets in the Clubs (Club). The whole system is controlled by the State Scientific-Technical Committee of the Council of Ministers of the USSR.

The first steps were taken to organize scientific documentation and information activity in the Peoples Republic of China in 1955, an unprecedentedly stormy period of development in technology, science and production. The Institute for Scientific Information was set up under the Academy of Sciences in 1956. Since that time an information network for the whole Republic has been in the process of organization.

In other countries in the socialist camp, most especially in the German Democratic Republic and in Poland, special attention has been turned to preparing technical-economic information and making it usable.

One example of a multi-stage organization of technical and economic information is the information network founded in 1959 in Czechoslovakia. The State Committee for the Development of Technology, which among other things is charged with introducing new technology into practice, also controls the technical-economic information for the whole country.

In this area its organ is the Institute for Technical and Economic Information which prepares complex information for the State Committee and for the controlling State organs. Control centers for technical-economic information have been established for the individual departments (Ressort); these centers support the technical-economic information offices linked to them by technical areas.

These information offices are the backbone of the whole technical and economic information system in Czechoslovakia. They are presently being set up and their great advantage will be that all duplication will be eliminated by the delineation of their responsibilities in technical and economic information activity. In this way we are striving for close cooperation among the technical and economic information offices all over the country which are related by virtue of technical area.

The last stage in the technical-economic information network in Czechoslovakia is the information office in the plants. The major responsibilities of these offices are popularizing the latest foreign and domestic advances in the particular field and evaluating information materials which are received from the technical centers of the technical and economic information offices of the particular department (Ressort) as well as from other sources.

A part of this whole system also constitutes the technical-economic information activity in the department (Ressort) of the Czechoslovak Ministry of Transportation. A technical center was formed under the Institute for Transport Research in Prague. This center took over the activities of the Documentation and Study Section established in 1950. Presently it is also entrusted by the Ministry of Transportation with the control of all technical and economic information activity in the whole department (Ressort). The extension of this information network, a matter of concern for all transport carriers, is in process.

The State Committee for the Development of Technology deals with the major methodology and coordination methods for the whole Republic.

As in other scientific areas and industrial branches, in the field of transportation it is absolutely necessary to set up technical and economic information offices which will meet current transportation requirements.

Most OSShD railroads have already recognized this need and have established scientific-technical documentation offices especially for railway matters.

For the most part, central technical libraries have been set up at the Ministries and documentation offices have been established at the research institutes or at other organizations and institutions. Among other things, these libraries and offices have as their responsibility the bibliographic review of new literature and serving as a source of technical and economic information.

After testing for four years the possibility of creating an organization for the exchange of documents and information between the members of the International Union of Railways

(UIC), the International Bureau for Documentation (UDC) was established in Paris in 1951. This Bureau, with a centrally controlled information service, is at the disposal of the UIC railroads.

A unified control in this area has now been prepared for the OSSHD railroads. The technical-economic information developed previously by the individual OSSHD railroads is to be transferred to information centers. These centers will then undertake the decentralized preparation of documentation materials for the individual OSSHD railroads.

The following things would be desirable in achieving the goals set:

- establishing the viewpoints in principle of the individual OSSHD railroads on the question of coordinating the activity of technical-economic information within the framework of the OSSHD;
- discussing the unification of working means and methods at the technical and economic documentation and information offices of the separate railways;
- formulating uniform, methodical principles of organization for the card indices which are to be set up;
- establishing a list of the periodicals which the individual railroads will evaluate at the first stage;
- establishing the scope of subjects in the first stage of assembling documentation and information;
- preparing a survey of the publications dealing with transportation matters in the countries of the participating railroads; this survey should include not only periodicals published regularly, but also the scientific research, construction and planning items already published by the research institute in our countries.

It is clear from the preceding that the tasks of the experts will not be small in organizing and coordinating technical economic documentation and information activity.

It will be seen that the major task in this area must be to assure that technical and economic information within the OSSHD is brought into harmony not only with the planned technical and economic development of transportation in the individual OSSHD countries, but also with the OSSHD tasks in mutual research, planning and construction work planned for 1961 - 1965. Before there can be agreement on the program for preparing scientific research themes, the OSSHD railroads must have available to them information on the world state of technical and economic advances in the subjects treated. By delineating the subjects for which the railroads participating in joint research work are responsible, the problems can be solved more quickly.

Well-organized and methodically controlled technical-economic information activity within the OSShD, standardized by stages, is related to the constantly increasing requirements which are being placed on the transport networks of all our countries. This then raises the question of whether there would not be an advantage in having one of the OSShD railroads direct the establishment of a central technical-economic information office, within the framework of the OSShD, for all transport carriers, thereby assuring methodical control, coordination and dissemination of information.

VI. REPORT ON THE WORK OF THE OSShD

COMMITTEE AND COMMISSIONS

Pages 18 - 23

Unsigned Article

A. Committee Session No. 30

The thirtieth session of the OSShD Committee for Railway Transport met on 21 and 22 March 1960 to discuss the results of the meetings held in Dresden on the questions of the rights of railways (9 - 18 February 1960) and the liabilities of railways (19 - 23 February 1960*).

The Committee confirmed the protocol of the convened session with the exception of Supplement 4 (Directives for the Organization of Cooperation for the Study of Socialist Rights by OSShD railroads) and Supplement 5 (Considerations on the Organization of Information in the Area of Transport Rights).

The problems of cooperation and information in the area of transport rights will be treated again at a Committee session after the introduction of additional data from the Dresden meeting and the remarks of the railways on the outlines of perspective - subject plans and work plans for 1960 - 1961.

The Committee took note of the positive work which had been done at the session on the standardization of railway liability.

In addition to dealing with the results of the Dresden meetings, the Committee also checked material on preparations for discussions by experts. It was concluded that discussions on the question of technical-economic information would be held in Warsaw between 8 and 11 June 1960 and discussions on the exchange of, and mutual work on, training films would be held in Moscow between 16 and 21 May 1960.

B. Committee Session No. 31

The thirty-first session of the Committee for Railway transport convened in Warsaw on 11 May 1960. The Committee confirmed the draft resolutions and recommendations proposed at the meeting of the Fourth Commission (20 - 30 April 1960).

Resolutions were prepared on the following questions:

- Standardization of four-axle O cars.

- Preparation of technical drafts for standard containers (Einheitsbehalter).
 - Standardization of Type B passenger cars with seats or with seats and berths.
 - Standardization of non-detachable equipment for sleeping cars used in international traffic.
 - Standardization of the types and main dimensions of roller bearings for cars used in international traffic.
 - Standardization of addresses for freight and passenger cars used in international traffic.
 - Designation of dimension limits (Begrenzung) for cars used in international traffic.
 - Standardization of cast iron for brake shoes.
- Recommendations were received on the following:
- Standardization of four-axle flat cars.
 - Choice of a fluorescent lighting system for passenger cars
 - Technical conditions for equipping passenger cars with fluorescent lighting
 - Standardization of leaf springs for four-axle cars used in international traffic.
 - Standardization of diaphragms and connecting platforms for passenger cars and of signal brackets for freight and passenger cars used in international traffic.

At this session the Committee also dealt with the data on the following problems which were prepared for the meeting of the Third Commission and the conference of experts:

- Utilizing exactly the testing equipment for scientific research, planning and construction work
- Telecommunications and the use of radio and television by the railroads.

In addition to the above, the Committee accepted the necessary changes to the "Regulations for Commission Sessions".

C. The Firm Text Of The SMPS (Soglasheniye o Mexhdunarodnom Passazhirskom Soobshchenii - Agreement On International Passenger Transport) and the SMPS Service Regulations worked out at the meeting of the First Commission in Warsaw in December 1958, have been in force since 1 June 1960. In connection with this, new sample tickets for international SMPS traffic have been in force since 1 June 1960; these will greatly facilitate the work of travel bureaus and station ticket offices.

In regard to the Uniform International Passenger Tariff (EMPT (Einheitlichen Internationalen Personentarif)), only the tariff terms (with the exception of paragraphs 6, 7 and 8 which remain unchanged), distance tables and appendices 1 and 2 came into force on 1 June 1960. Tables B and C with new ticket prices are presently not yet in force; only price tables for group tariffs I, II and III are in force.

New price tables, D 1, 2, 3 and 4, for use for ship routes have been introduced. The designation of tariffs is no different from the tariffs which came into effect 1 April 1957.

D. Conference Of The Third Commission

A conference of the Third Commission of the Committee on the Uniform Transit Tariff (ETT (Einheitlichen Transittarif)) of the SMGS (Soglasheniye o Mezhdunarodnom Zheleznodorozhnom Gruzovom Soobshchenii - Agreement on International Goods Transport) is planned in Warsaw for July 1960.

The agenda of this conference includes several important tariff questions, such as the outlining of a new international nomenclature for goods, drafting a readjustment of ETT rates both according to distance and to the weight of the consignments, and several suggestions recommended by OSSHD railroads for changes in and supplements to the text of the ETT. Besides these, the intention is to examine the possibility of standardizing domestic rate structures within the OSSHD, as well as rates which are to be increased for the use of containers and for refrigerated goods which are to be transported in refrigerator trains.

E. Joint Conference of OSSHD and UIC Experts

Discussions on further cooperation between the OSSHD and the UIC (Union Internationale des Chemins de Fer - International Railroad Union) began in Paris in September 1959 between representatives of the OSSHD Committee for Railway Transport and the General Secretariat of the UIC.

It was thought that several problems of interest to both organizations should be treated by joint OSSHD/UIC conferences. In this way the views of the experts could be brought closer and, if possible, a unified opinion would result. A draft agreement to this effect was prepared. This was confirmed by the two organizations and came into force for the joint OSSHD/UIC discussions.

A joint OSSHD/UIC conference convened in Paris between 25 and 27 April 1960. The participants included five OSSHD railways (MAV (Magyar Allami Vasutak - Hungarian State Railways), DR (Deutsche Reichsbahn - German State Railways), PKP, SZD (Sovetskoye Zheleznoye Dorogoy - Soviet State Railways), and CSD (Ceskoslovenske

Statne Drahy - Czechoslovak State Railways), representatives from UIC administrations (SNCB (Societe Nationale des Chemins de Fer Belges - National Society of Belgian Railways), DB (Deutsche Bundesbahn - German Federal Railway), SNCF (Societe Nationale des Chemins de Fer - French State Railways), SBB (Schweizerische Bundesbahnen - Swiss State Railways) and SJ and representatives from the OSShD Committee and from the UIC General Secretariat.

The first problem treated at this joint OSShD/UIC conference was that of a uniform international goods nomenclature. Work on this problem had already been done for several years by both the UIC and the OSShD.

At the suggestion of the USSR, the question of a uniform international goods nomenclature will also be dealt with by the Economic Commission for Europe of the UNO (United Nations Organization).

The task of the conference was to discuss basic agreements on how a uniform international goods nomenclature could be worked out for tariff and statistical purposes.

The draft nomenclatures prepared by the OSShD and the UIC formed the basis of discussion. As a result of the discussion the conference came to the mutual conclusion that a uniform nomenclature could be worked out on the basis of the OSShD draft nomenclature (branches, sections, groups) below the UIC nomenclature items. The conference continued discussion of this question in Prague between 23 and 25 May 1960. After examining the practical possibilities for preparing a draft based on the above, the project will be presented for confirmation by the Second Commission of the UIC and the Third Commission of the OSShD Committee for Railway Transport.

The participants expressed the unanimous feeling that the subject of this first joint OSShD/UIC conference will be resolved in such a way that both the OSShD railways and the UIC railway administrations will be satisfied.

F. Regional Conference For The Coordination of 1960 Transport Plans

A regional conference convened in Khabarovsk in the USSR between 22 February and 2 March 1960. The participants were representatives of the railways of the Chinese Peoples Republic; the Korean Peoples Democratic Republic, the Mongolian Peoples Republic and the USSR, as well as representatives of the Ministries of Foreign Trade of China, Korea and the USSR.

The transport requirements for 1960 for international export, import and transit goods were discussed and coordinated at this conference. According to this coordinated plan, transport requirements for 1960 will be considerably above those for 1959.

Special attention was given to the distribution of transports in the individual annual quarters and to the seasonal nature of certain types of goods.

In contrast to previous conferences, at this regional conference information was presented by the leaders of the delegations on the fulfillment of the transport plans for the previous year. By means of this information it was possible to give the participants of the conference a detailed view of the state of transport requirements in traffic between the countries concerned.

Measures necessary to the fulfillment of the coordinated transport plans were also worked out. Special attention was given to the work of the border stations and to line capacities of each railway of the countries represented at the conference.

G. Conference Of The Fourth Commission

The Fourth Commission of the OSSHD met in Warsaw between 20 and 30 April 1960. The participants were representatives of the OSSHD railroads and the OSSHD Committee, and representatives of the Third Section and of the Transport Commission of RGW (Rat für Gegenseitige Wirtschaftshilfe - Council for Mutual Economic Aid).

At the plenary session the chairman of the Fourth Commission reported on the fulfillment of the decisions of the preceding session.

The leaders of the delegations of the OSSHD railways reported on the fulfillment and utilization of the decisions and recommendations previously confirmed.

It was established that in the previous year the OSSHD railways reported on the fulfillment and utilization of the decisions and recommendations previously confirmed.

It was established that in the previous year the OSSHD railroads had conducted extensive additional work on determining the conditions for the clearance (Durchlassfähigkeit) of vehicles with O-MM and 1-MM limits. The work of the CSD in this was especially noteworthy.

The practical work for adapting lines for the O-MM cars has been successfully finished by most of the railways. In view of the constantly increasing car dimensions and the range of transports which exceed clearance limits, as well as of the ever broader use of machines and instruments in line work, the interested OSSHD railroads have recommended that fixed equipment (buildings, contact line masts, pilings of line underpasses, etc.), measured from the line axis outward, should be arranged according to the 1-SM clearance profile, and that a clear area should be provided below the top of the rail at each installation (building foundations, contact line masts, cable, pipe and wire

lines, etc.). Each OSShD railroad, taking into account the specific requirements of its own installations, must determine the technical equipment and operating conditions for extending the dimensions of the clearance profile.

The conference established that the work conducted up to now by the DR (Deutsche Reichsbahn - German State Railways), PKP (Polish State Railways), SZD (Sovetskiye Zheleznye Dorogi - Soviet State Railways), and CSD (Ceskoslovenske Statne Drahy - Czechoslovak State Railways) on fixing the clearance displacements of vehicles in operation is not adequate to establish finally the clearance profile dimensions necessary at least for traffic of vehicles with O-WM and 1-WM limits.

The theoretical and operational tests conducted were concerned primarily with the deflection (Auslenkung) of vehicles in relation to the line, and dealt only slightly with the deflection which arises from the shifting of the line. Generally related measurements were not made on the vehicles; these are as dependent on the position of the vehicle as they are on the road bed.

To avoid an unnecessary outlay on finishing the reconstruction work for the 1-SM clearance already begun on OSShD lines, it has become necessary to expedite to the maximum tests to determine the deflection of vehicles in operation.

Further, the conference established that the work conducted first by the USSR railways and later by the Czechoslovak, GDR, Chinese and Bulgarian railways, on the technical and economic feasibility of introducing expanded clearances has shown that the introduction of expanded vehicle dimensions is an effective and progressive measure.

Most OSShD members do not yet appear completely convinced of the economic necessity of introducing expanded clearances since, under present conditions, they deal with O-WM and, to a lesser extent, 1-WM car limits.

For this reason it was felt that it would be practical to solve the question of the feasibility of using the 1-SM clearance profile, and the DR and CSD will continue according to two variations the work begun:

Variation 1. Under conditions of unrestricted traffic of 1-WM vehicles on all European railroads.

Variation 2. Under conditions of introducing 1-SM and 1-WM clearances only on OSShD railroads, and the necessity stemming therefrom to have in the vehicle part rolling stock currently in service to meet the clearance presently in use on these railways.

Several conclusions on the standardization of cars were accepted. For a rational transport of bulk goods in direct international traffic, as well as for creating the conditions necessary for cooperation and specialization of production of four-axle freight cars within the framework of the RGW, the Fourth Commission felt it was necessary to standardize four-axle open freight cars as follows:

1. Capacity 60-62 tons
2. Volume about 70 eu. m.
3. Length of car body over end sills 12,800 mm
4. Height of the box sides 2,000 mm
5. The cars can have up to three door openings on each side wall; these can be closed by means of double swinging doors. The side-wall doors are to be 1,800 mm wide.

For four-axle platform cars the following dimensions were accepted:

1. Capacity 60 - 62 tons
2. Length of car body over end sills 13,400 mm
3. Loading area 37 sq. m.
4. Minimum height of side walls 0.4 m

In planning the above cars the conference recommended that synthetic materials be used and consideration be given to the possibility of mechanizing loading and unloading operations and of installing automatic couplings.

The major dimensions for passenger cars used in international traffic were finally approved for standardizing passenger cars. The standardized type B passenger car will have the following dimensions and characteristics:

1. Length of car over buffers about 24,500 mm
2. Exterior width of car 2,880 mm
3. Compartment width at least 2,000 mm
4. Corridor width at least 710 mm

5. Length of vestibule at least 1,000 mm
6. Distance between truck centers 17,200 - 17,400 mm
7. The car frame will be so constructed that automatic central coupling can be installed later.
8. The exterior walls will be thick enough to make it possible both to obtain the desired interior temperature and to assure proper sound-damping.
9. The minimum floor area of the toilet and washroom will be:
 - a. in the toilets 1.2 sq. m.
 - b. in the washrooms 0.6 sq. m.
 - (with minimum widths of 0.7 m)
10. The number of compartments and seats and the compartment lengths in the coaches are to be:
 - a. In A cars:

Number of compartments	9
Number of seats (9 X 6)	54
Compartment length	about 2,100 mm
 - b. In B cars:

Number of compartments	10
Number of seats (10 X 8)	80
Compartment length	about 1,900 mm
 - c. In A B cars:

Number of first-class compartments	4
Number of first-class seats (4 X 6)	24
Number of second-class compartments	5
Number of second-class seats (5 X 8)	40
Length of first-class compartment	about 2,100 mm
Length of second-class compartment	about 2,100mm

For the combination seat-berth cars, the outlines of which correspond basically to A or B cars, the following major parameters have been recommended:

a. in A cars

number of compartments	9
number of berths (9 X 4)	54
compartment length	about 2,100 mm

b. in B cars

number of compartments	9
number of berths (9 X 6)	54
compartment length	about 1,900 mm

Arrangement of the berths:

The compartment will be fitted with six upholstered berths, three berths on each wall.

When the car is in use as a coach, the upper berths will be closed into the wall and serve as backrests.

In addition, the sleeper car will be equipped with the minimum amount of equipment which will still afford the maximum possible passenger comfort.

Independent of this, the conference dealt with the problem of introducing the most modern and efficient type of car lighting. There were received a number of recommendations which contained the basic developmental lines for work on this subject as well as the technical conditions for outfitting the cars with fluorescent lights.

On the question of further work on standardized improvement technology, it was decided to continue work where the technological processes which have been worked out contain the following:

- a. description of the work processes,
- b. schematics of the work processes and, where possible, a working diagram of the process,
- c. ground plan of work shop equipment (plants or technical research offices)

d. index of machines, equipment and special machine tools, with photographs, plans and drawings wherever possible.

A fairly large part of the conference was concerned with a discussion of the standardization of assemblies and components for cars. The most important problem lay in the standardization of types and in the major dimensions of roller bearings for cars used in international traffic.

The following things were decreed in regard to the conditions necessary for maintenance and improvement of OSSHD cars equipped with roller bearings, and in regard to the production and extension of service life of roller bearings:

1. the main dimensions of the roller bearings for the journals of passenger and freight cars are to be standardized as follows:

- a. 120 X 240 X 80
- b. 130 X 250 X 80
- c. 130 X 240 X 80

2. as of 1 January 1961, all newly-built passenger and freight cars are to be equipped with roller bearings, the dimensions of which are shown in point 1 of this decree.

In addition, several resolutions were received which dealt with the standardization of leaf and helical springs for four-axle freight and passenger cars, change-over devices, signal brackets on passenger and freight cars, and markings on passenger and freight cars. In regard to the latter, the resolution dealt with marking the car clearance limits and marking the load capacity on cars used in international traffic.

As a result of a discussion of details presented by the OSSHD Committee and the member railroads, the conference expressed the opinion that there should be an advancing of the dates set in the plan for joint scientific research on developing a control valve standardized according to the technical conditions laid down by the OSSHD Committee. It was recommended that the number of control valves now in use not be increased during this transitional period until the standardized control valve is introduced.

The Commission felt it would be practical to continue the development of cast brake shoes which are to be used in international OSSHD traffic. Large-scale experimental tests with cast brake shoes having an increased phosphorous content were especially recommended.

The following basic requirements must be met in these new types of cast brake shoes:

1. the brake shoe must show no decrease in mechanical strength when compared to standard shoes;

2. the friction value of the brake shoes must not be more than that of standard shoes at speeds of 0 to 50 km per hour, or less than the standard shoes at higher speeds;

3. the brake shoe must be completely interchangeable with standard shoes, and the shoes must necessitate no change in the mechanical part of the brakegear.

For the purpose of further standardizing brake equipment, the following chemical analysis of cast iron is to be adhered to in producing brake shoes on vehicles used in international traffic: in producing brake shoes on vehicles used in international traffic:

No.	Designation of elements		
1	carbon (%)	3.0 - 3.4	2.8 - 3.6
2	silicon (%)	1.0 - 1.5	1.4 - 2.0
3	manganese (%)	1.0 - 1.5	0.4 - 3.4
4	phosphorus (%)	0.2 - 0.6	below 0.8
5	sulphur (%)	below 0.2	below 0.16
6	graphite (contained in carbon %)		
	Brinell hardness rating	187 - 241	190 20

Since nonmetallic brake shoes are viewed as an advance in brake technology because they will permit obtaining a great braking effect, comparison tests on these brake shoes are to be continued so that the development and selection will be expedited.

The Commission heard reports from the railway representatives of the GDR, Poland, the USSR and Czechoslovakia on the progress of work on developing a uniform, automatic central buffer coupling. As a result of the exchange of views, it was noted that the outline projects and experimental research conform to the technical conditions confirmed by the Committee.

The conference felt it would be desirable to take the necessary steps for expediting the preparation of working drawings of the coupling so that an experimental model can be produced through the Fifth Commission.

H. Second Conference Of The Commission For Motor Transport And Highways

The second conference of the Commission for Motor Transport and Highways (Eleventh Commission) convened in Warsaw in May, 1960.

At this meeting those participating were representatives of OSShD Ministries of Transport - specialists in the field of motor transport and highways - and the representative of the Standing Commission for Transport of the RGW (Rat fur gegenseitige Wirtschaftshilfe - Council for Mutual Economic Aid) .

The most important items on the agenda were the following:

- preparation of an agreement on the organization of international highway transport between socialist countries;
- a uniform system of indices for the utilization of the vehicle park;
- satisfying OSShD needs for modern garage equipment necessary for developing motor transport;
- standards within the OSShD to assure a rational solution of motor transport problems;
- work program for typing and standardizing road-building and road maintenance machinery.

In addition, the delegates reported on the progress of work corresponding to the Eleventh Commission work plan for 1960.

In preparing an agreement on international highway transport the conference accepted the recommendations of the Organization for Passenger and Goods Transport between Socialist and Capitalist Countries.

In order to be able to better determine and plan motor transport capacities and to organize work accordingly, the participants at the conference worked out recommendations for introducing uniform indices of the performances of motor transport in the socialist countries. By means of these indices, information on the status of transport plans as well as the exchange of the best experiences will be much more exact.

The participants from the OSShD members recommended an exchange of drawings, catalogues and other materials in dealing with the problem of satisfying the needs for modern garage equipment for motor transport. The working group was charged with investigating the need for garage equipment and establishing how production could be organized centrally through the RGW.

The participants expressed the opinion that it would be practical to call a conference on highway transport in 1961.

It is economically advantageous to organize centrally the production of the expensive machines and equipment used in road-building and maintenance. To this end a working program was recommended for realizing this task within the OSShD with the aid of the RGW.

It was determined that the work in this field of OSShD motor transport and highway affairs as provided for in the work plan of the Eleventh Commission had been handled satisfactorily. However, not all of the OSShD members have participated actively in the work as yet. The participating delegations expressed the feeling that it was necessary to pay greater attention to the realization of the work handled within the OSShD.

Further, a recommendation was made which dealt with the completion of the work of the Eleventh Commission and its working groups.

The decision and recommendations of this conference will serve the further development of motor transport and highways, in socialist countries and will lead to a better organization of international passenger and freight transportation between these countries.

5148

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